

CLAIMS:

1. Disc drive apparatus (1) capable of reading/writing discs (100; 200) of different sizes, comprising:
 - a first rotary drive device (30) for holding and rotating a first-type disc (100) in a first play position;
 - a second rotary drive device (50) for holding and rotating a second-type disc (200) in a second play position;
 - scanning means (40) for scanning a surface of a rotating disc (100; 200) in its play position;
 - wherein the second rotary drive device (50) is arranged opposite the scanning means (40).
2. Disc drive apparatus according to claim 1, wherein said first rotary drive device (30) defines a first rotation axis (35), and wherein said second rotary drive device (50) defines a second rotation axis (55) which is located at a distance from the first rotation axis (35) of the first rotary drive device (30).
3. Disc drive apparatus according to any of the previous claims, wherein said second rotary drive device (50) comprises a second motor (51) for engaging and driving a second motor hub (53), said second motor hub (53) being adapted to hold a disc (200) completely independently.
4. Disc drive apparatus according to claim 3, wherein said second motor hub (53) is at least partly magnetic, for example by comprising a magnetic material or by comprising an electromagnet.
5. Disc drive apparatus according to claim 3 or 4, wherein, in operation, a front face (53a) of said second motor hub (53) contacts an upper surface (202; 212) of said disc (200), said second rotary drive device (50) being free from additional clamping members on the side of the opposite lower disc surface (203; 213).

6. Disc drive apparatus according to any of the previous claims 3 to 5, wherein at least said second motor hub (53) is axially displaceable between a rest position and a pickup position.

7. Disc drive apparatus according to any of the previous claims 3 to 6, wherein said second motor hub (53) has a front face (53a) and a centering part (53b) projecting therefrom, said centering part (53b) having an outer diameter corresponding to the inner diameter of the central hole (201) of a small disc (200), and said centering part (53b) preferably having an axial dimension smaller than an axial dimension of a disc hub (210).

8. Disc drive apparatus according to any of the previous claims, wherein said scanning means (40) comprise a slide (41) that is displaceably mounted on a subframe (21) which is pivotably connected to a frame (20) about a horizontal pivot axis (22).

9. Disc drive apparatus according to claim 8, wherein said first rotary drive device (30) comprises at least one hub (33) mounted on said subframe (21).

10. Disc drive apparatus according to claim 9, wherein said first rotary drive device (30) further comprises a spindle motor (31) mounted on said subframe (21) and a second hub (34) mounted on said frame (20), the first hub (33) being mounted on a spindle (32) of said spindle motor (31).

11. Disc drive apparatus according to any of the previous claims, further comprising a loading mechanism adapted to receive a disc (100; 200) in a loading position and bringing the disc into a play position, said loading mechanism comprising a carrier tray (10) capable of reciprocating between a loading position in which the tray (10) is located outside a disc drive housing (2) and a play position in which the tray (10) is located inside said disc drive housing.

12. Disc drive apparatus according to claim 11, wherein said carrier tray (10) comprises a first reception space (12) formed as a recess in a top surface (11) of the carrier tray (10), having a first center (12c);

wherein said carrier tray (10) further comprises a second reception space (13) formed as a recess in said top surface (11), having a second center (13c), the second reception space (13) having a diameter smaller than the diameter of the first reception space (12);

wherein said carrier tray (10) further has an opening (14) at least coinciding with said first center (12c) and said second center (13c).

13. Disc drive apparatus according to any of claims 11 to 12, wherein said carrier tray (10) is arranged below said second rotary drive device (50) and above said scanning means (40).

14. Disc drive apparatus according to any of the previous claims, adapted to execute the following steps in a disc loading operation:

- a first step of receiving a disc (200) on a carrier tray (10);
- a second step of displacing the carrier tray (10) to bring the disc (200) into a play position aligned with the second rotary drive device (50);
- a third step of picking up said disc (200) by a motor hub (53) of said second rotary drive device (50);
- a fourth step of lifting said disc (200) from said carrier tray (10);
- a fifth step of raising said scanning means (40) towards said disc (200).

15. Disc drive apparatus according to claim 14, wherein said third step comprises the step of axially lowering at least said motor hub (53) towards said disc (200) lying on said carrier tray (10);

and wherein said fourth step comprises the step of axially raising at least said motor hub (53) holding said disc (200).

16. Disc drive apparatus according to claim 15, wherein said third step comprises the step of magnetically attracting said disc (200) against a front face (53a) of said motor hub (53).

17. Record disc (200) provided with an annular disc hub (210) which is magnetically attractable, the disc having a first main surface (203) for facing a write/read pickup (40) and a second main surface (202) opposite said first main surface (203) for facing

a front face (53a) of a motor hub (53) of a disc drive apparatus (1) according to any of claims 1 to 16;

wherein said annular disc hub (210) has a top surface (212) which is flush with said second main surface (202) of the disc (200) or, preferably, which is slightly recessed below said second main surface (202) of the disc (200) over a small distance.

18. Record disc according to claim 17, wherein said annular disc hub (210) has a bottom surface (213) which is flush with said first main surface (203) of the disc (200) or, preferably, which is slightly recessed from said first main surface (203) of the disc (200) over a small distance;

said annular disc hub (210) preferably being symmetrical so that said two distances are the same.